What is claimed is:

1. A thermoelectric conversion material comprising a half-Heusler alloy represented by the formula $QR(L_{1-p}Z_p)$, where Q is at least one element selected from group 5 elements, R is at least one element selected from cobalt, rhodium, and iridium, L is at least one element selected from tin and germanium, Z is at least one element selected from indium and antimony, and p is a numerical value that is equal to or greater than 0 and less than 0.5.

2. The thermoelectric conversion material according to claim 1, wherein p is greater than 0 and less than 0.5.

3. The thermoelectric conversion material according to claim 2, wherein p is greater than 0 and equal to or less than 0.05.

4. The thermoelectric conversion material according to claim 3, wherein p is greater than 0 and equal to or less than 0.02.

5. The thermoelectric conversion material according to claim 1, wherein Q is niobium.

6. The thermoelectric conversion material according to claim 1, wherein R is cobalt.

7. The thermoelectric conversion material according to claim 1, wherein L is tin.

8. The thermoelectric conversion material according to claim 1, wherein p is greater than 0 and Z is antimony.

9. The thermoelectric conversion material according to claim 1, wherein Q is niobium, R is cobalt, L is tin, and p is 0.

10. The thermoelectric conversion material according to claim 1, wherein p is greater than 0, Q is niobium, R is cobalt, L is tin, and Z is antimony.

11. The thermoelectric conversion material according to claim 1, wherein the half-Heusler alloy is made of single phase.

12. A thermoelectric conversion element comprising a thermoelectric conversion material according to claim 1, and a first electrode and a second electrode connected to the thermoelectric conversion material.

13. The thermoelectric conversion element according to claim 12, further comprising a p-type thermoelectric conversion material connected to at least one of the first electrode and the second electrode.

14. The thermoelectric conversion element according to claim 12, further comprising an insulator connected to at least one of the first electrode and the second electrode.

15. A thermoelectric conversion element comprising:

n-type thermoelectric conversion materials and p-type thermoelectric conversion materials, wherein:

the n-type thermoelectric conversion materials and the p-type thermoelectric conversion materials are alternately and electrically connected in series, and

at least one of the n-type thermoelectric conversion materials is a thermoelectric conversion material according to claim 1.

16. A cooling device comprising a thermoelectric conversion element according to claim 12 and a DC power supply electrically connected to the thermoelectric conversion element.

17. An electric apparatus comprising:

a thermoelectric conversion element according to claim 12; and

a load electrically connected to the thermoelectric conversion element and operated by a current supplied from the thermoelectric conversion element.

18. An electric power generating method of using a thermoelectric conversion element comprising a thermoelectric conversion material and a first electrode and a second electrode connected to the thermoelectric

conversion material, the method comprising:

supplying heat so that a temperature difference is caused between the first electrode and the second electrode so as to produce a potential difference between the first electrode and the second electrode, wherein

the thermoelectric conversion material comprises a half-Heusler alloy represented by the formula $QR(L_{1-p}Z_p)$, where Q is at least one element selected from group 5 elements, R is at least one element selected from cobalt, rhodium, and iridium, L is at least one element selected from tin and germanium, Z is at least one element selected from indium and antimony, and p is a numerical value that is equal to or greater than 0 and less than 0.5.

19. The method of generating electric power according to claim 18, wherein p is greater than 0 and less than 0.5.

20. The method of generating electric power according to claim 19, wherein p is greater than 0 and equal to or less than 0.05.

21. The method of generating electric power according to claim 20, wherein p is greater than 0 and equal to or less than 0.02.

22. The method of generating electric power according to claim 18, wherein Q is niobium.

23. The method of generating electric power according to claim 18, wherein R is cobalt.

24. The method of generating electric power according to claim 18, wherein L is tin.

25. The method of generating electric power according to claim 18, wherein p is greater than 0 and Z is antimony.

26. The method of generating electric power according to claim 18, wherein Q is niobium, R is cobalt, L is tin, and p is 0.

27. The method of generating electric power according to claim 18,

wherein p is greater than 0, Q is niobium, R is cobalt, L is tin, and Z is antimony.

28. The method of generating electric power according to claim 18, wherein the half-Heusler alloy is made of single phase.

29. The method of generating electric power according to claim 18, wherein the thermoelectric conversion element further comprises a p-type thermoelectric conversion material connected to at least one of the first electrode and the second electrode.

30. The method of generating electric power according to claim 18, wherein the thermoelectric conversion element further comprises an insulator connected to at least one of the first electrode and the second electrode.

31. A cooling method of using a thermoelectric conversion element comprising a thermoelectric conversion material and a first electrode and a second electrode connected to the thermoelectric conversion material, the method comprising:

causing a potential difference between the first electrode and the second electrode so as to produce a temperature difference between the first electrode and the second electrode such that one of the first electrode and the second electrode is made a low temperature part, wherein

the thermoelectric conversion material comprises a half-Heusler alloy represented by the formula $QR(L_{1-p}Z_p)$, where Q is at least one element selected from group 5 elements, R is at least one element selected from cobalt, rhodium, and iridium, L is at least one element selected from tin and germanium, Z is at least one element selected from indium and antimony, and p is a numerical value that is equal to or greater than 0 and less than 0.5.

32. The cooling method according to claim 31, wherein p is greater than 0 and less than 0.5.

33. The cooling method according to claim 32, wherein p is greater than 0 and equal to or less than 0.05.

34. The cooling method according to claim 33, wherein p is greater than 0 and equal to or less than 0.02.

35. The cooling method according to claim 31, wherein Q is niobium.

36. The cooling method according to claim 31, wherein R is cobalt.

37. The cooling method according to claim 31, wherein L is tin.

38. The cooling method according to claim 31, wherein p is greater than 0 and Z is antimony.

39. The cooling method according to claim 31, wherein Q is niobium, R is cobalt, L is tin, and p is 0.

40. The cooling method according to claim 31, wherein p is greater than 0, Q is niobium, R is cobalt, L is tin, and Z is antimony.

41. The cooling method according to claim 31, wherein the half-Heusler alloy is made of single phase.

42. The cooling method according to claim 31, wherein the thermoelectric conversion element further comprises a p-type thermoelectric conversion material connected to at least one of the first electrode and the second electrode.

43. The cooling method according to claim 31, wherein the thermoelectric conversion element further comprises an insulator connected to at least one of the first electrode and the second electrode.